

# Climatology of the United States

## No. 20 1971-2000

**Station: DEVILS LAKE KDLR, ND**

**COOP ID: 322158**

**Climate Division: ND 3**

**NWS Call Sign:**

**Elevation: 1,464 Feet**

**Lat: 48°06N**

**Lon: 98°51W**

### Temperature (°F)

Mean (1)				Extremes										Degree Days (1) Base Temp 65		Mean Number of Days (3)					
Month	Daily Max	Daily Min	Mean	Highest Daily(2)	Year	Day	Highest Month(1) Mean	Year	Lowest Daily(2)	Year	Day	Lowest Month(1) Mean	Year	Heating	Cooling	Max >= 100	Max >= 90	Max >= 50	Max <= 32	Min <= 32	Min <= 0
Jan	14.7	-2.5	6.1	53	1990	11	21.5	1990	-36+	1966	28	-9.6	1982	1827	0	.0	.0	@	26.7	31.0	18.7
Feb	22.3	5.2	13.8	60+	2000	22	26.0	1998	-37	1996	1	-3.1	1979	1436	0	.0	.0	.4	20.9	28.0	12.6
Mar	33.6	17.3	25.5	72	1963	23	35.4	2000	-28+	1980	1	16.4	1996	1226	0	.0	.0	2.9	13.2	29.5	5.4
Apr	52.1	32.0	42.1	97	1980	22	51.1	1987	-12	1979	6	31.8	1979	690	3	.0	.1	16.8	2.4	18.3	.3
May	67.5	44.9	56.2	96+	1980	23	65.5	1977	1	1967	3	48.5	1979	309	36	.0	.5	28.9	.0	3.7	.0
Jun	75.3	54.3	64.8	103	1961	27	73.8	1988	29	1964	1	59.1	1985	101	95	.0	1.7	30.0	.0	.0	.0
Jul	80.1	58.6	69.4	103	1973	11	74.2	1989	39+	1967	4	62.6	1992	38	172	.1	3.1	31.0	.0	.0	.0
Aug	79.1	56.2	67.7	103	1949	7	73.5	1983	33+	1982	27	61.7	1977	61	143	.1	3.3	31.0	.0	.0	.0
Sep	67.7	46.5	57.1	100	1976	7	62.6	1998	20	1965	26	51.7	1984	258	20	.1	.8	28.4	.0	2.1	.0
Oct	53.9	34.6	44.3	94	1963	4	49.2	1973	-2	1991	31	39.4	1976	643	0	.0	.0	18.9	1.3	13.2	@
Nov	33.1	18.4	25.8	77	1975	5	37.3	1999	-25	1985	29	13.8	1996	1178	0	.0	.0	3.3	14.5	27.8	2.9
Dec	19.4	3.6	11.5	59	1969	1	25.1	1997	-37	1983	23	-2.6	1983	1657	0	.0	.0	.1	25.1	30.9	13.5
Ann	49.9	30.8	40.4	103+	1973	11	74.2	1989	-37+	1996	1	-9.6	1982	9424	469	.3	9.5	191.7	104.1	184.5	53.4

+ Also occurred on an earlier date(s)

@ Denotes mean number of days greater than 0 but less than .05

Complete documentation available from: [www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)

Issue Date: February 2004

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

(3) Derived from 1971-2000 serially complete daily data

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### Precipitation (inches)

		Precipitation Totals								Mean Number of Days (3)				Precipitation Probabilities (1)											
														Probability that the monthly/annual precipitation will be equal to or less than the indicated amount											
		Means/Medians(1)		Extremes						Daily Precipitation				Monthly/Annual Precipitation vs Probability Levels											
														These values were determined from the incomplete gamma distribution											
Month	Mean	Median	Highest Daily(2)	Year	Day	Highest Monthly(1)	Year	Lowest Monthly(1)	Year	>= 0.01	>= 0.10	>= 0.50	>= 1.00	.05	.10	.20	.30	.40	.50	.60	.70	.80	.90	.95	
Jan	.58	.49	.70	1956	27	1.26	1982	.00	1973	8.4	1.8	@	.0	.12	.20	.29	.37	.45	.53	.61	.71	.84	1.05	1.23	
Feb	.51	.43	.86	1981	28	1.41	1987	.10	1973	6.7	1.8	@	.0	.11	.16	.23	.30	.37	.44	.52	.61	.74	.94	1.13	
Mar	.80	.75	1.74	1966	4	2.15	1983	.17	1991	7.2	2.8	.2	.0	.17	.24	.36	.47	.57	.69	.82	.97	1.18	1.50	1.81	
Apr	.90	.82	1.47	1953	24	3.51	1986	.00	1980	7.1	3.0	.4	.0	.05	.14	.28	.41	.56	.71	.89	1.11	1.42	1.91	2.40	
May	2.14	1.86	2.22	1974	19	6.26	1974	.32	1984	9.5	5.0	1.3	.3	.44	.64	.95	1.24	1.53	1.84	2.18	2.60	3.15	4.03	4.87	
Jun	3.83	3.32	2.92	1994	20	9.25	1994	.85	1974	12.1	7.2	2.3	.9	1.31	1.68	2.20	2.65	3.08	3.52	4.00	4.56	5.27	6.38	7.41	
Jul	3.29	2.84	2.37	2000	11	10.30	1993	.31	1976	10.1	6.1	2.2	.8	.58	.87	1.35	1.80	2.26	2.76	3.33	4.01	4.92	6.40	7.81	
Aug	2.21	2.17	1.93	1996	19	4.17	1985	.22	1984	8.9	4.6	1.2	.5	.78	.98	1.29	1.54	1.78	2.04	2.31	2.63	3.03	3.66	4.24	
Sep	1.80	1.60	2.18	1991	16	3.95	1991	.17	1993	8.4	4.0	1.0	.3	.35	.51	.77	1.02	1.26	1.53	1.83	2.19	2.67	3.44	4.17	
Oct	1.47	1.12	1.76	1949	10	4.93	1982	.02	1976	7.3	3.3	.8	.1	.07	.14	.31	.50	.72	.99	1.33	1.76	2.37	3.42	4.48	
Nov	.83	.75	1.96	1986	8	2.59	2000	.04	1999	6.8	2.6	.4	.1	.06	.11	.21	.33	.45	.60	.78	1.01	1.33	1.86	2.40	
Dec	.57	.52	.86	1960	5	1.14	1977	.10	1979	7.4	1.9	.1	.0	.15	.20	.29	.36	.43	.50	.59	.69	.81	1.01	1.20	
Ann	18.93	17.93	2.92	Jun 1994	20	10.30	Jul 1993	.00+	Apr 1980	99.9	44.1	9.9	3.0	12.41	13.63	15.22	16.44	17.53	18.59	19.70	20.93	22.43	24.64	26.56	

+ Also occurred on an earlier date(s)

# Denotes amounts of a trace

@ Denotes mean number of days greater than 0 but less than .05

\*\* Statistics not computed because less than six years out of thirty had measurable precipitation

(1) From the 1971-2000 Monthly Normals

(2) Derived from station's available digital record: 1948-2001

(3) Derived from 1971-2000 serially complete daily data

Complete documentation available from:  
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Lon: 98°51W

Snow (inches)																							
Snow Totals															Mean Number of Days (1)								
Means/Medians (1)					Extremes (2)										Snow Fall >= Thresholds					Snow Depth >= Thresholds			
Month	Snow Fall Mean	Snow Fall Median	Snow Depth Mean	Snow Depth Median	Highest Daily Snow Fall	Year	Day	Highest Monthly Snow Fall	Year	Highest Daily Snow Depth	Year	Day	Highest Monthly Mean Snow Depth	Year	0.1	1.0	3.0	5.0	10.0	1	3	5	10
Jan	6.3	6.1	7	5	8.0	1999	13	13.1	1971	24	1989	16	20	1989	6.2	3.2	.7	.2	.0	-9.9	-9.9	-9.9	-9.9
Feb	4.7	3.9	7	5	4.0	1986	20	12.2	1980	24	1994	26	23	1994	3.7	2.3	.2	.0	.0	24.8	17.0	10.4	5.5
Mar	6.3	7.9	3	3	8.0	1985	29	13.0	1988	26	1987	1	10	1994	3.8	2.1	.3	.2	.0	13.8	10.2	7.3	1.0
Apr	2.2	.4	#	#	8.0	1986	15	10.0+	1990	14	1996	5	3	1996	1.1	.5	.2	.1	.0	1.6	.7	.3	@
May	.3	.0	#	0	6.0	1991	4	6.0	1991	6	1991	4	#+	1991	@	@	@	@	.0	@	@	@	.0
Jun	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Jul	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Aug	.0	.0	0	0	.0	0	0	.0	0	0	0	0	0	0	.0	.0	.0	.0	.0	.0	.0	.0	.0
Sep	.0	.0	#	0	1.0	1972	26	1.0	1972	#+	1984	26	#+	1984	@	@	.0	.0	.0	.0	.0	.0	.0
Oct	1.9	.0	#	0	8.0	1985	8	13.0	1991	7	1991	24	1	1991	.7	.6	.3	.1	.0	.6	.2	.2	.0
Nov	5.4	4.3	2	1	18.0	1986	8	27.0	1986	25	1986	13	12	1986	3.1	2.0	.4	.2	.1	8.3	4.6	2.6	.7
Dec	7.2	6.6	4	3	7.0	1988	27	15.0	1988	20	1996	16	18	1996	4.8	3.0	.8	.3	.0	21.2	11.2	6.7	.4
Ann	34.3	29.2	N/A	N/A	18.0	Nov 1986	8	27.0	Nov 1986	26	Mar 1987	1	23	Feb 1994	23.4	13.7	2.9	1.1	.1	-9.9	-9.9	-9.9	-9.9

+ Also occurred on an earlier date(s) #Denotes trace amounts

@ Denotes mean number of days greater than 0 but less than .05

-9/-9.9 represents missing values

Annual statistics for Mean/Median snow depths are not appropriate

(1) Derived from Snow Climatology and 1971-2000 daily data

(2) Derived from 1971-2000 daily data

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<b>Freeze Data</b>									
<b>Spring Freeze Dates (Month/Day)</b>									
<b>Temp (F)</b>	<b>Probability of later date in spring (thru Jul 31) than indicated(*)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	6/03	5/29	5/25	5/22	5/19	5/16	5/13	5/10	5/05
<b>32</b>	5/20	5/17	5/14	5/12	5/10	5/08	5/05	5/03	4/29
<b>28</b>	5/15	5/10	5/06	5/03	4/30	4/27	4/24	4/20	4/15
<b>24</b>	5/04	4/29	4/26	4/23	4/20	4/17	4/14	4/11	4/06
<b>20</b>	4/22	4/17	4/14	4/12	4/09	4/06	4/04	4/01	3/27
<b>16</b>	4/15	4/11	4/08	4/05	4/03	3/31	3/29	3/26	3/21
<b>Fall Freeze Dates (Month/Day)</b>									
<b>Temp (F)</b>	<b>Probability of earlier date in fall (beginning Aug 1) than indicated(*)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	9/04	9/09	9/12	9/15	9/18	9/21	9/23	9/27	10/01
<b>32</b>	9/14	9/18	9/21	9/23	9/26	9/28	10/01	10/04	10/08
<b>28</b>	9/22	9/27	9/30	10/03	10/06	10/09	10/12	10/15	10/20
<b>24</b>	10/02	10/08	10/12	10/15	10/18	10/21	10/24	10/28	11/02
<b>20</b>	10/16	10/20	10/23	10/26	10/28	10/31	11/03	11/06	11/10
<b>16</b>	10/17	10/22	10/26	10/29	11/01	11/04	11/07	11/10	11/15
<b>Freeze Free Period</b>									
<b>Temp (F)</b>	<b>Probability of longer than indicated freeze free period (Days)</b>								
	<b>.10</b>	<b>.20</b>	<b>.30</b>	<b>.40</b>	<b>.50</b>	<b>.60</b>	<b>.70</b>	<b>.80</b>	<b>.90</b>
<b>36</b>	142	135	129	125	121	117	112	107	100
<b>32</b>	155	149	145	142	138	135	132	127	122
<b>28</b>	180	173	167	163	158	154	149	144	136
<b>24</b>	204	196	190	185	180	176	171	165	157
<b>20</b>	219	213	209	205	202	198	194	190	184
<b>16</b>	232	225	220	215	211	207	203	197	190

\* Probability of observing a temperature as cold, or colder, later in the spring or earlier in the fall than the indicated date.

0/00 Indicates that the probability of occurrence of threshold temperature is less than the indicated probability.

Derived from 1971-2000 serially complete daily data

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### Degree Days to Selected Base Temperatures (°F)

Base	Heating Degree Days (1)												
	Below	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
65	1827	1436	1226	690	309	101	38	61	258	643	1178	1657	9424
60	1672	1296	1071	548	201	41	10	20	147	488	1028	1502	8024
57	1579	1212	978	466	149	21	3	8	94	396	938	1409	7253
55	1517	1156	917	415	118	13	0	4	66	336	878	1347	6767
50	1362	1016	772	297	60	2	0	0	21	202	732	1192	5656
32	835	559	313	47	1	0	0	0	0	9	284	668	2716

### Cooling Degree Days (1)

Base	Cooling Degree Days (1)												
	Above	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
32	31	47	111	349	751	984	1158	1105	752	390	96	33	5807
55	0	0	1	27	155	306	445	396	128	3	0	0	1461
57	0	0	0	19	124	254	385	338	96	1	0	0	1217
60	0	0	0	10	83	184	299	257	59	0	0	0	892
65	0	0	0	3	36	95	172	143	20	0	0	0	469
70	0	0	0	0	13	35	84	65	5	0	0	0	202

### Growing Degree Units (2)

Base	Growing Degree Units (Monthly)												Growing Degree Units (Accumulated Monthly)											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
40	0	0	7	142	492	737	904	856	498	187	17	0	0	0	7	149	641	1378	2282	3138	3636	3823	3840	3840
45	0	0	0	77	351	587	749	701	357	99	6	0	0	0	0	77	428	1015	1764	2465	2822	2921	2927	2927
50	0	0	0	35	227	439	594	546	229	43	1	0	0	0	0	35	262	701	1295	1841	2070	2113	2114	2114
55	0	0	0	17	132	296	439	393	127	11	0	0	0	0	0	17	149	445	884	1277	1404	1415	1415	1415
60	0	0	0	5	62	172	290	248	62	1	0	0	0	0	0	5	67	239	529	777	839	840	840	840
Base	Growing Degree Units for Corn (Monthly)												Growing Degree Units for Corn (Accumulated Monthly)											
50/86	0	0	6	101	296	451	582	542	289	110	11	0	0	0	6	107	403	854	1436	1978	2267	2377	2388	2388

(1) Derived from the 1971-2000 Monthly Normals

(2) Derived from 1971-2000 serially complete daily data

**Note:** For corn, temperatures below 50 are set to 50, and temperatures above 86 are set to 86

Complete documentation available from:

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## Notes

- a. The monthly means are simple arithmetic averages computed by summing the monthly values for the period 1971-2000 and dividing by thirty. Prior to averaging, the data are adjusted if necessary to compensate for data quality issues, station moves or changes in station reporting practices. Missing months are replaced by estimates based on neighboring stations.
- b. The median is defined as the middle value in an ordered set of values. The median is being provided for the snow and precipitation elements because the mean can be a misleading value for precipitation normals.
- c. Only observed validated values were used to select the extreme daily values.
- d. Extreme monthly temperature/precipitation means were selected from the monthly normals data.  
Monthly snow extremes were calculated from daily values quality controlled to be consistent with the Snow Climatology.
- e. Degree Days were derived using the same techniques as the 1971-2000 normals.  
Complete documentation for the 1971-2000 Normals is available on the internet from:  
[www.ncdc.noaa.gov/oa/climate/normal/usnormals.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormals.html)
- f. Mean "number of days statistics" for temperature and precipitation were calculated from a serially complete daily data set.  
Documentation of the serially complete data set is available from the link below:
- g. Snowfall and snow depth statistics were derived from the Snow Climatology.  
Documentation for the Snow Climatology project is available from the link under references.

## Data Sources for Tables

Several different data sources were used to create the Clim20 climate summaries. In some cases the daily extremes appear inconsistent with the monthly extremes and or the mean number of days statistics. For example, a high daily extreme value may not be reflected in the highest monthly value or the mean number of days threshold that is less than and equal to the extreme value. Some of these difference are caused by different periods of record. Daily extremes are derived from the station's entire period of record while the serial data and normals data were are for the 1971-2000 period. Therefore extremes observed before 1971 would not be included in the 1971-2000 normals or the 1971-2000 serial daily data set. Inconsistencies can also occur when monthly values are adjusted to reflect the current observing conditions or were replaced during the 1971-2000 Monthly Normals processing and are not reconciled with the Summary of the Day data.

- a. Temperature/ Precipitation Tables
  1. 1971-2000 Monthly Normals
  2. Cooperative Summary of the Day
  3. National Weather Service station records
  4. 1971-2000 serially complete daily data
- b. Degree Day Table
  1. Monthly and Annual Heating and Cooling Degree Days Normals to Selected Bases derived from 1971-2000 Monthly Normals
  2. Daily Normal Growing Degree Units to Selected Base Temperatures derived from 1971-2000 serially complete daily data
- c. Snow Tables
  1. Snow Climatology
  2. Cooperative Summary of the Day
- d. Freeze Data Table  
1971-2000 serially complete daily data

## References

- U.S. Climate Normals 1971-2000, [www.ncdc.noaa.gov/normal.html](http://www.ncdc.noaa.gov/normal.html)  
U.S. Climate Normals 1971-2000-Products Clim20, [www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html](http://www.ncdc.noaa.gov/oa/climate/normal/usnormalsprods.html)  
Snow Climatology Project Description, [www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html](http://www.ncdc.noaa.gov/oa/climate/monitoring/snowclim/mainpage.html)  
Eischeid, J. K., P. Pasteris, H. F. Diaz, M. Plantico, and N. Lott, 2000: Creating a serially complete, national daily time series of temperature and precipitation for the Western United States. J. Appl. Meteorol., 39, 1580-1591,  
[www1.ncdc.noaa.gov/pub/data/special/serialcomplete\\_jam\\_0900.pdf](http://www1.ncdc.noaa.gov/pub/data/special/serialcomplete_jam_0900.pdf)